

WHAT IS CLAIMED IS:

1. An optical antenna system for a free-space communication system,
and the optical antenna system comprising
a fixed optical antenna assembly comprising
a single wavelength optical receiver assembly comprising
a first convex lens with a focal point; and
a single wavelength optical detector mounted at the
focal point of the first convex lens; and
a dual wavelength optical transmitter assembly comprising
a second convex lens with a focal point; and
a dual wavelength optical transmitter mounted at the
focal point of the second convex lens to produce a first and a second laser beam
with different wavelengths; and
an adjustable optical antenna assembly corresponding to the fixed
optical antenna assembly and comprising
a single wavelength optical transmitter assembly corresponding
to the single wavelength optical receiver assembly in the fixed optical antenna
assembly and comprising
a third convex lens with a focal point; and
a single wavelength optical transmitter mounted at the
focal point of the third convex lens; and
a dual wavelength optical receiver assembly corresponding to
the dual wavelength optical transmitter assembly and comprising
a fourth convex lens having a focal point; and

1 an optical splitter mounted at the focal point of the
2 fourth convex lens to reflect the first laser beam and being transparent to the
3 second laser beam;
4 an optical alignment detector mounted in a position
5 corresponding to the optical splitter to receive the reflected first laser beam and
6 to pass a received signal to an alignment controller in the free-space
7 communication system;
8 an optical alignment filter mounted between the optical
9 alignment detector and the optical splitter;
10 an optical data detector mounted in a position
11 corresponding to the optical splitter to receive the second laser beam and to pass
12 a received signal to a receiver amplifier in the free-space communication system;
13 and
14 a second optical filter mounted between the optical
15 data detector and the optical splitter.
16 2. The optical antenna system for a free-space communication system as
17 claimed in claim 1, wherein the optical data detector is separated from the optical
18 alignment detector by an angle of 90°.